Searching for Sustainability
in an Encroaching and Transforming Environment

5 April 2004

Prepared by
David S. Eady

Sustain the Mission — Secure the Future

Army Mission Defined

- "…to execute the National Security Strategy (NSS) and the National Military Strategy (NMS)" *– How The Army Runs*
- "…to serve the American people, protect enduring national interests, and fulfill national military responsibilities" *– FM 1*
- "…to provide national defense and security for American citizens—our ultimate customers" *– AR 5-1*

What "Business" Are We In?

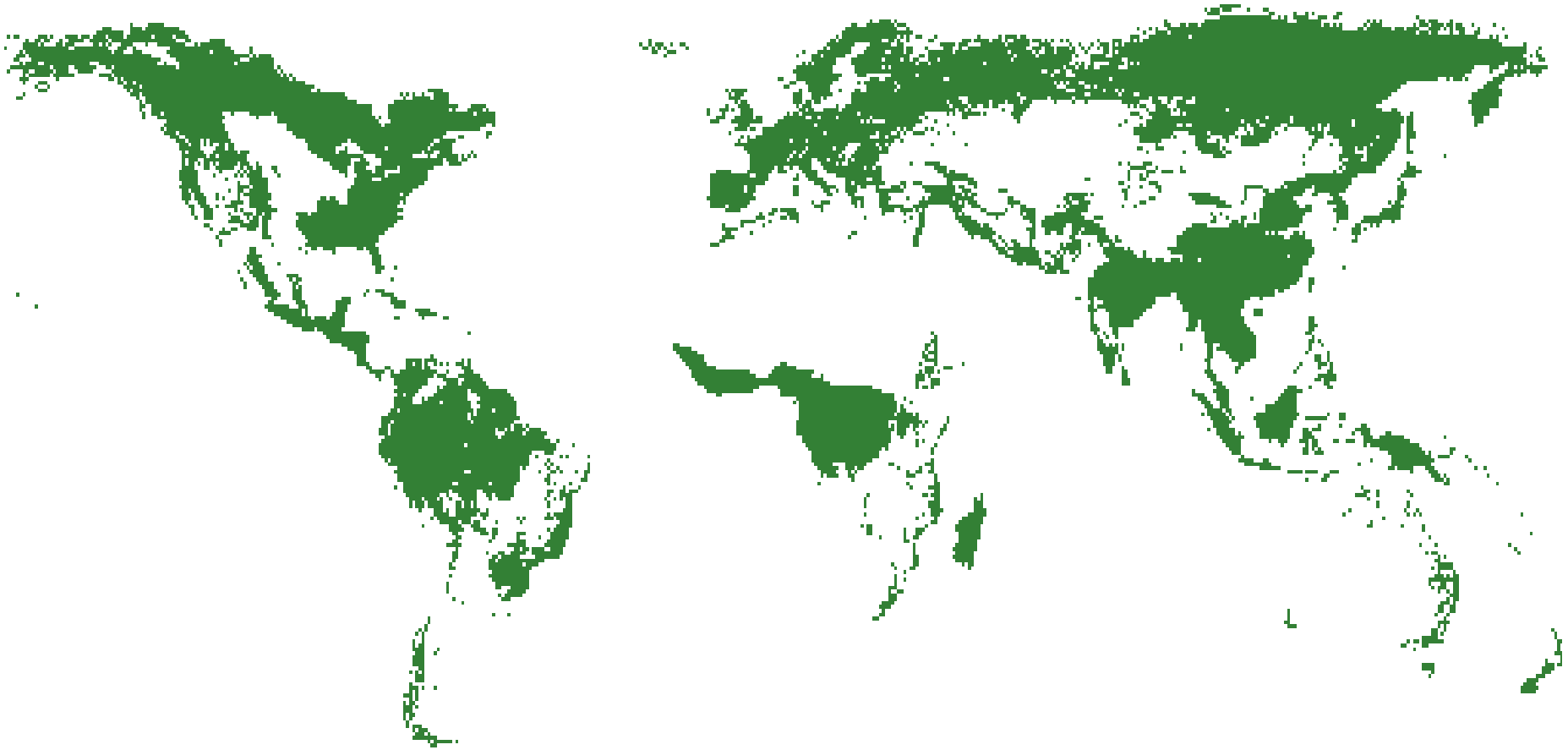
We're in the security business!

- Security:
  - "freedom from doubt, anxiety or fear"
  - "freedom from fear of *privation* or attack"
- Privation:
  - "lack of *basic necessities* or comforts of life"

Sustainability and security are both about protecting long-term national interests

Frontier Forests

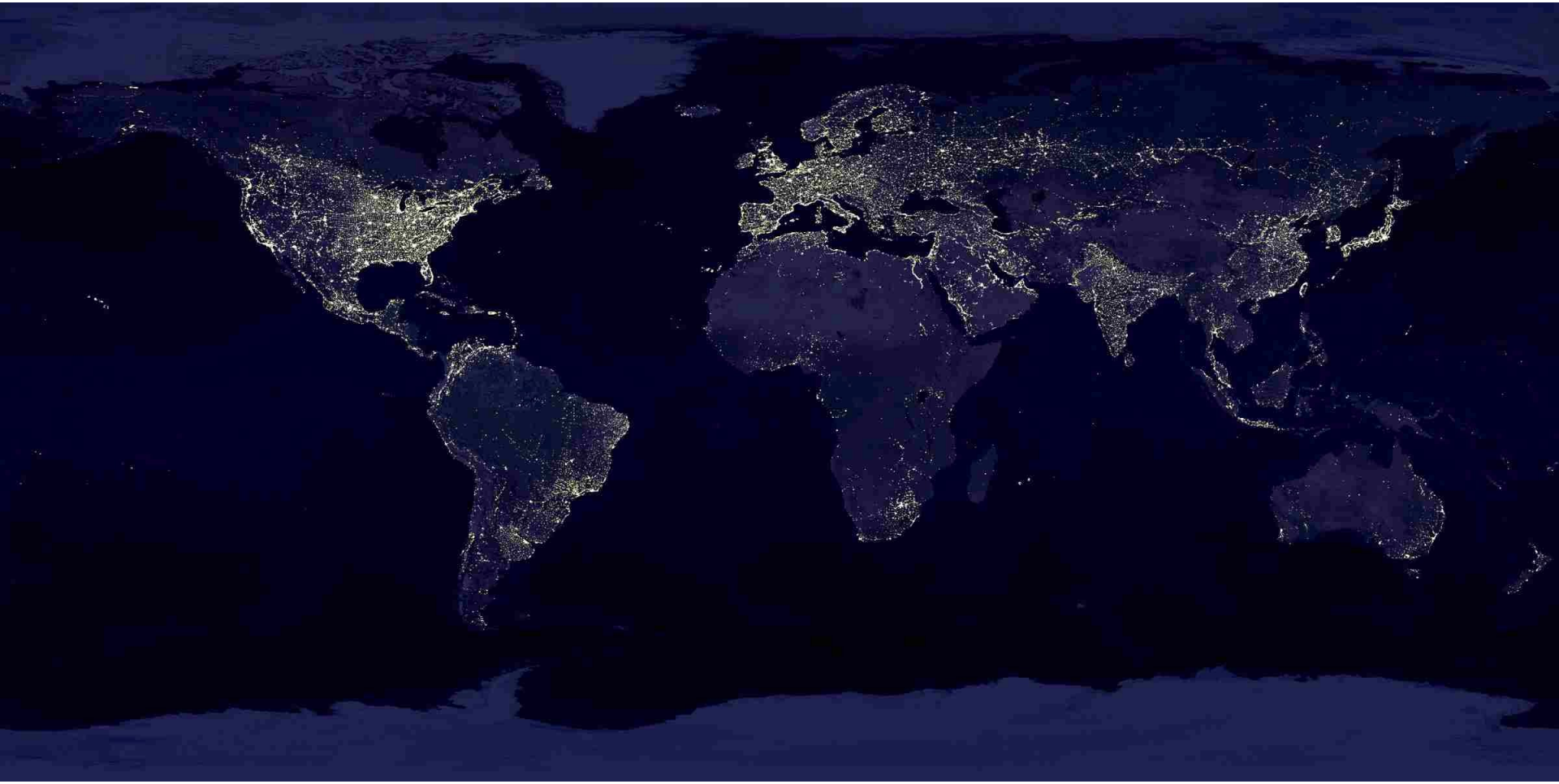
8,000 Years Ago



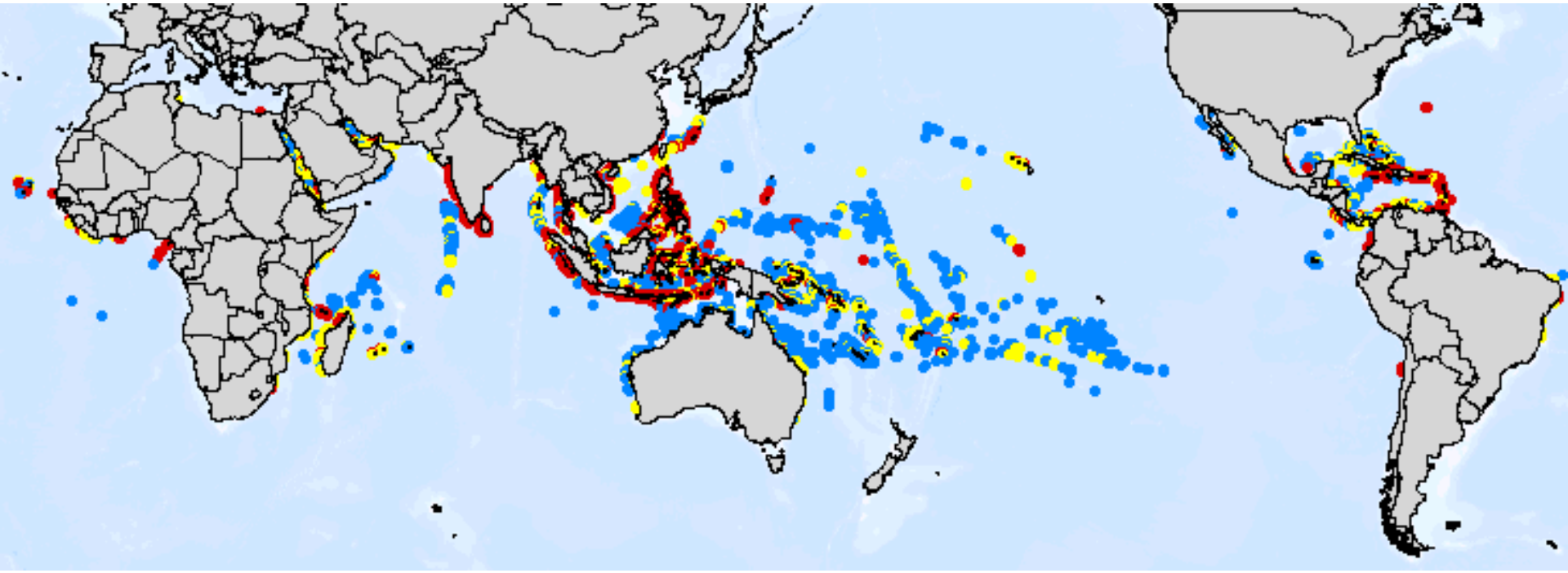
Frontier Forests

Today

Earth Lights



Risk to Coral Reefs



Low

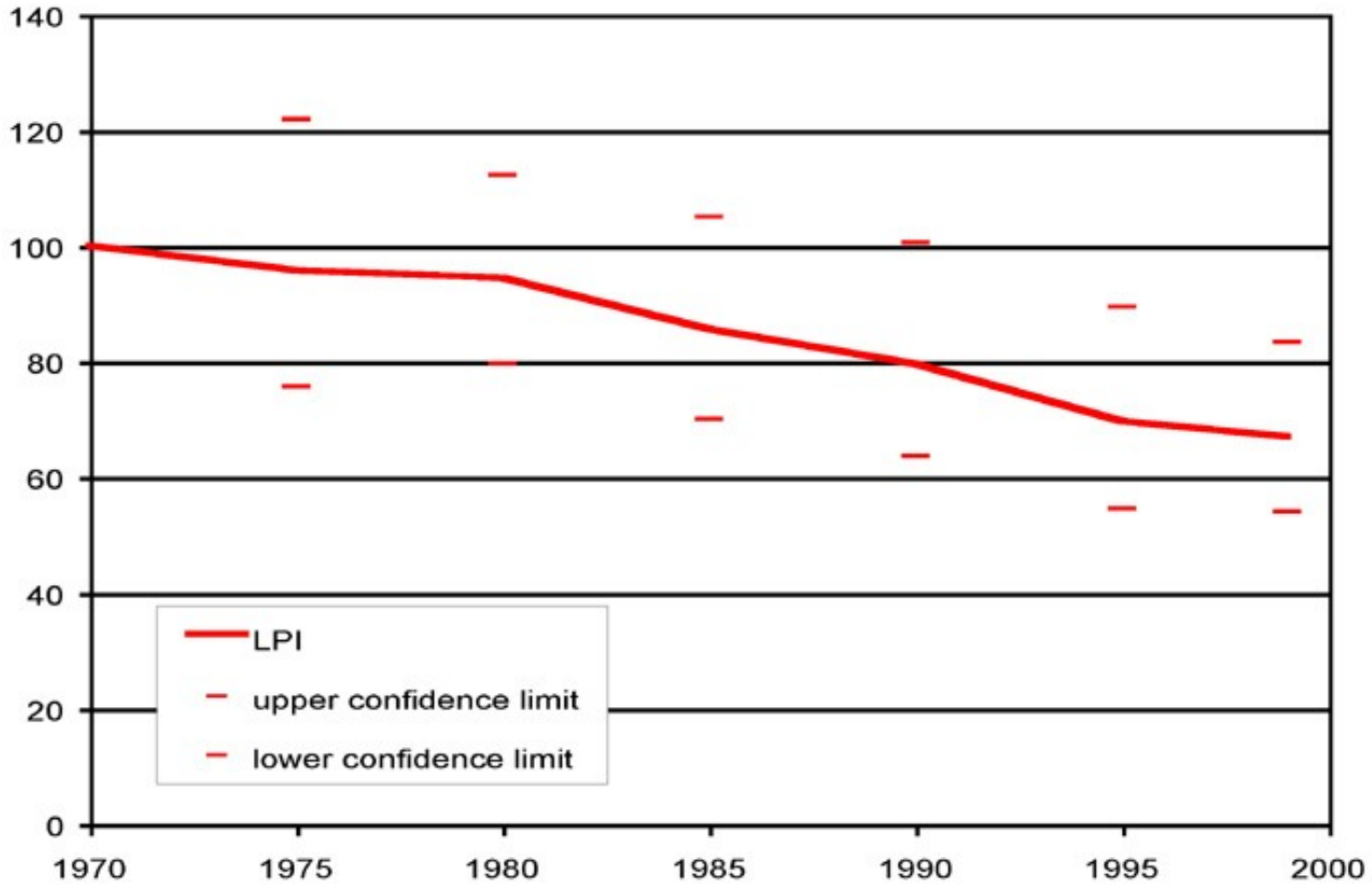
Medium

High

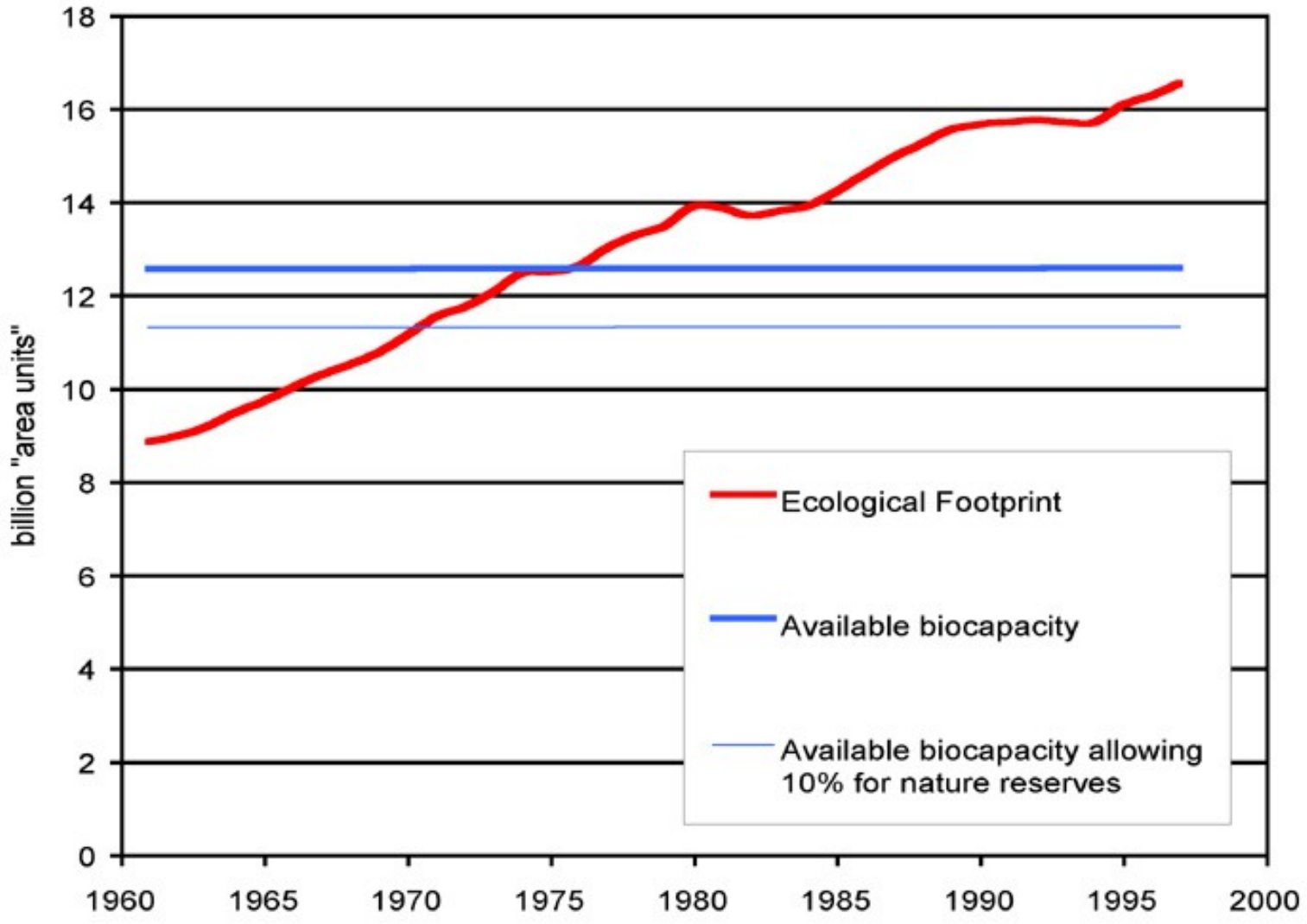
Source: *World Resources 2000-2001*

Living Planet Index

Years 1970 - 2000

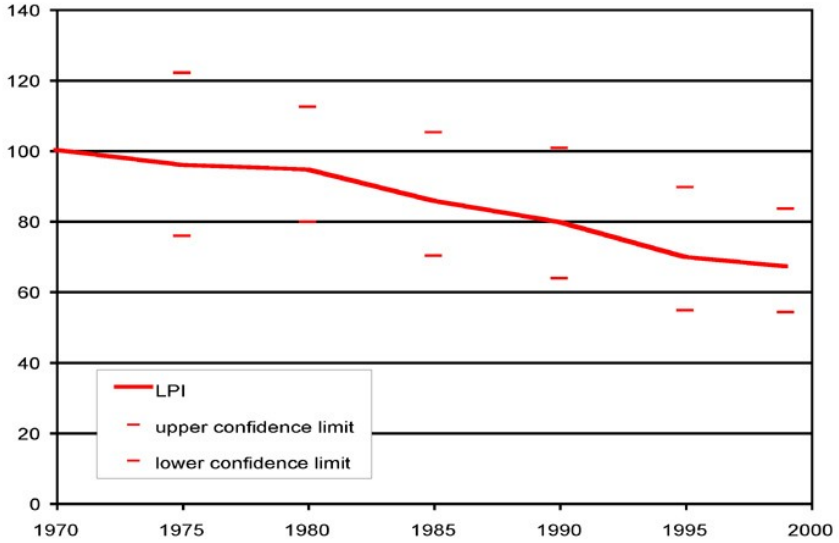


Ecological Footprint



Supply vs. Demand

Living Planet Index



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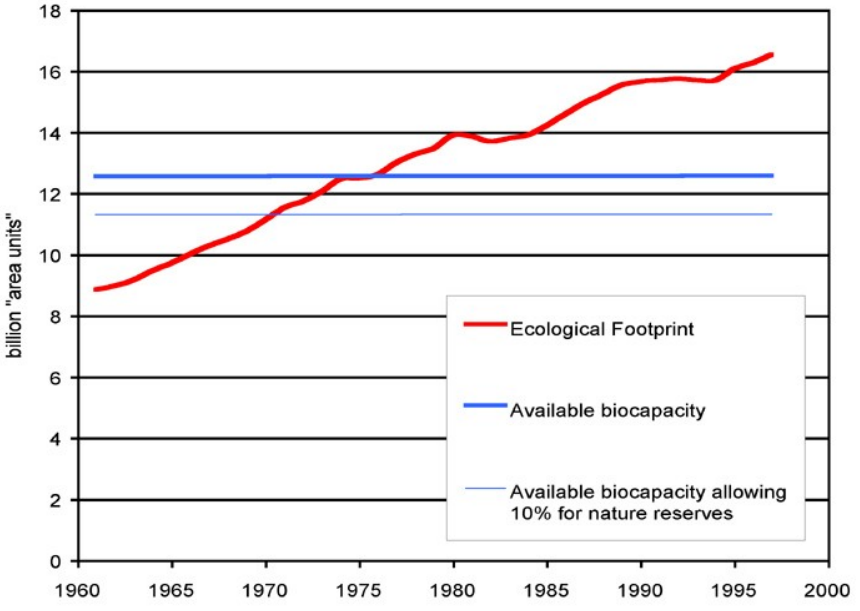
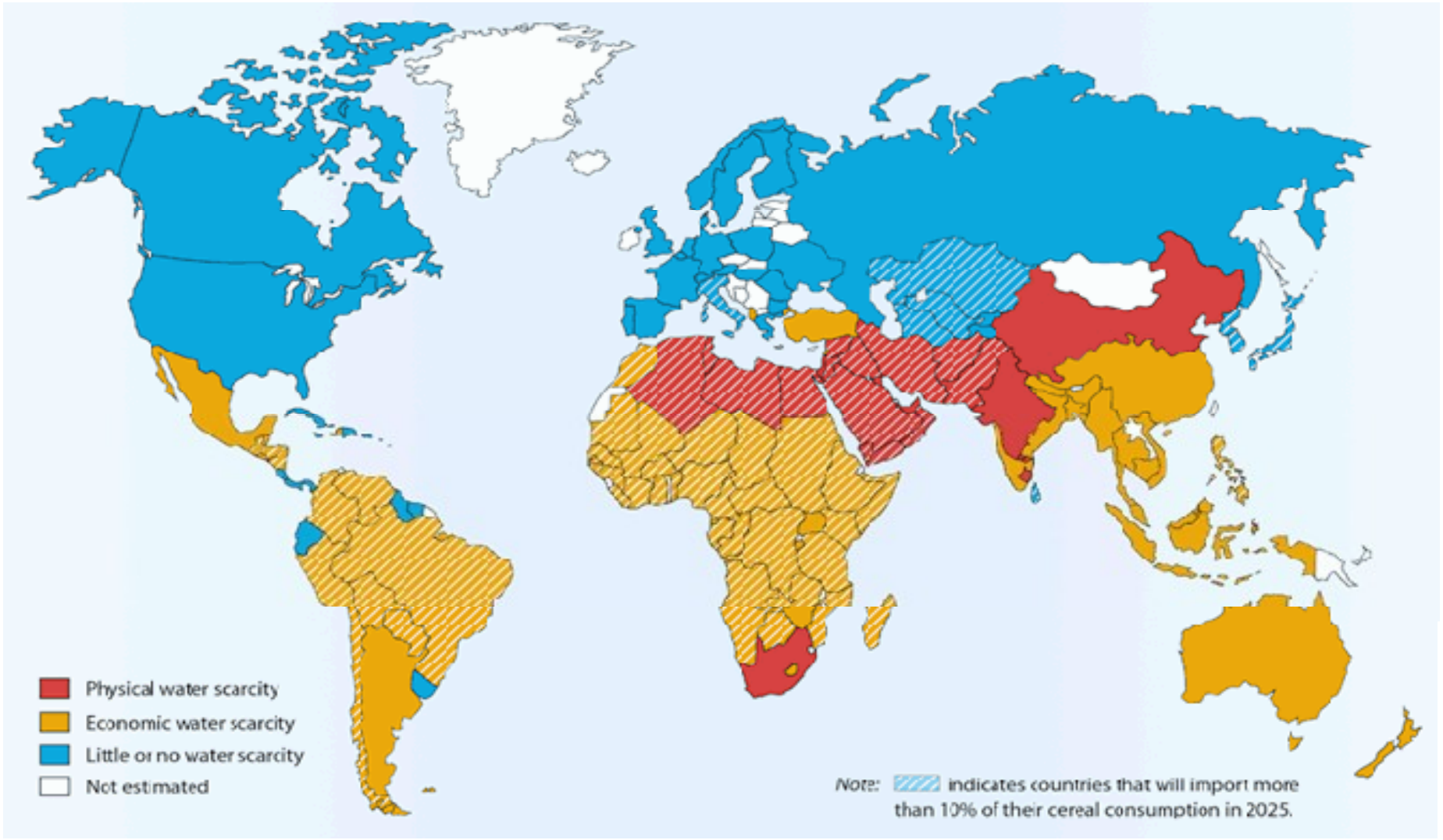
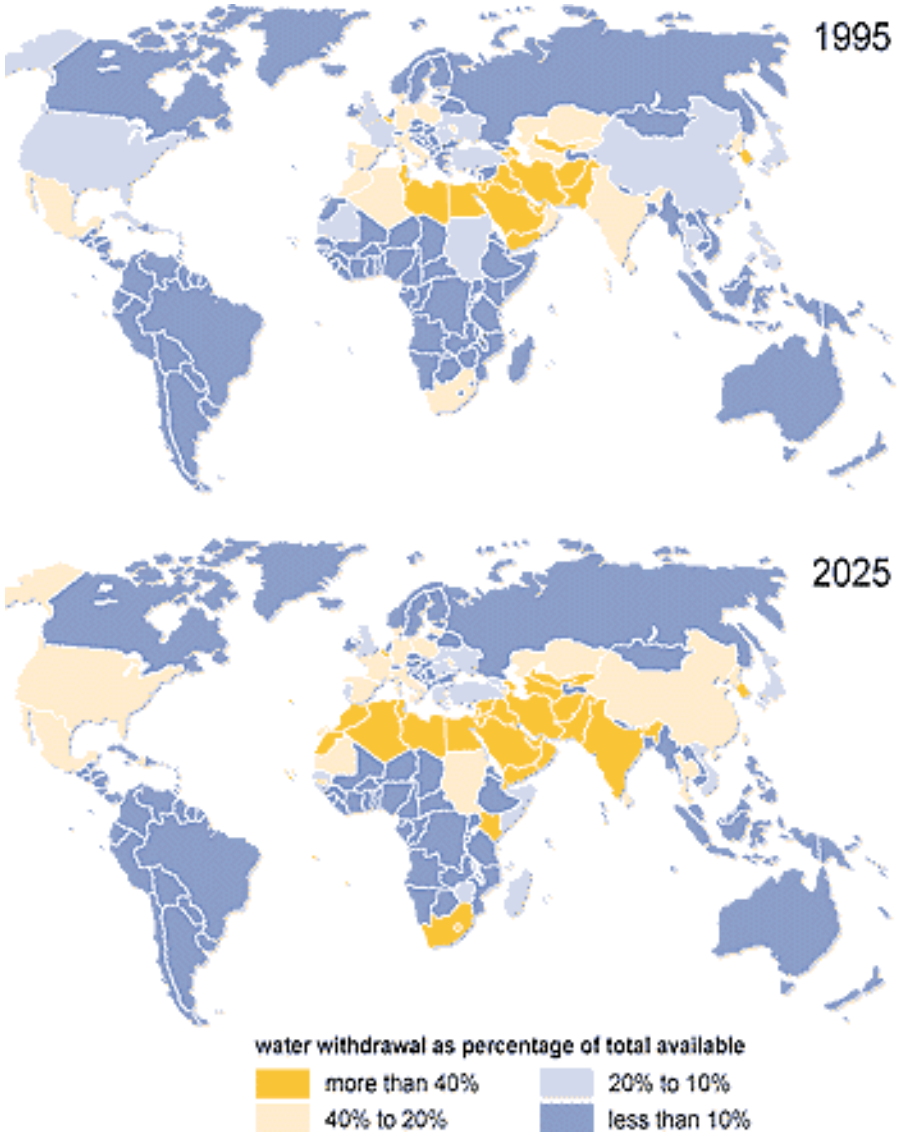


Water Scarcity


Physical water scarcity
Economic water scarcity
Little or no water scarcity
Not estimated
Note: indicates countries that will import more than 10% of their cereal consumption in 2025.

Source: International Water Management Institute 2002

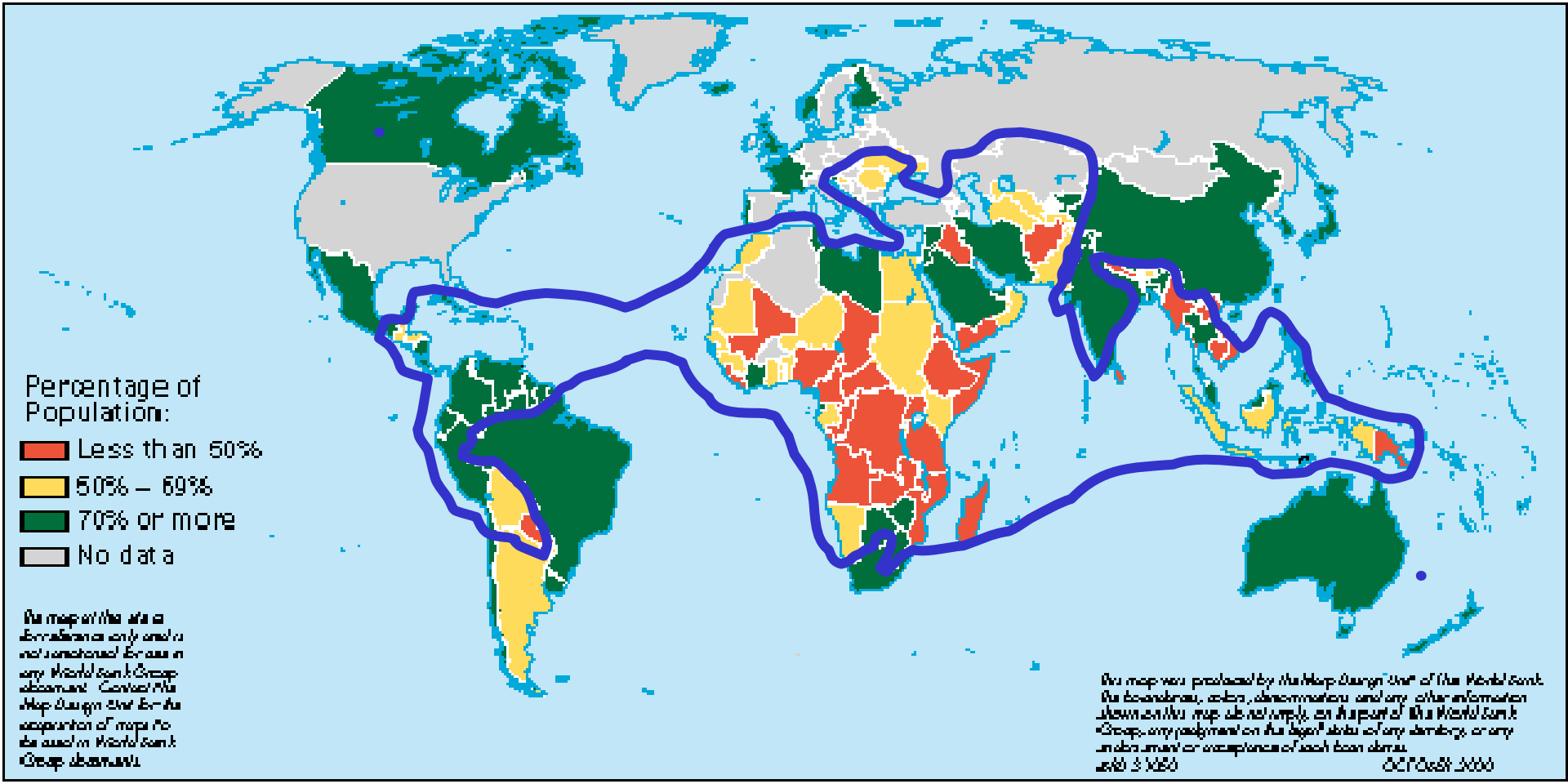
Water Scarcity

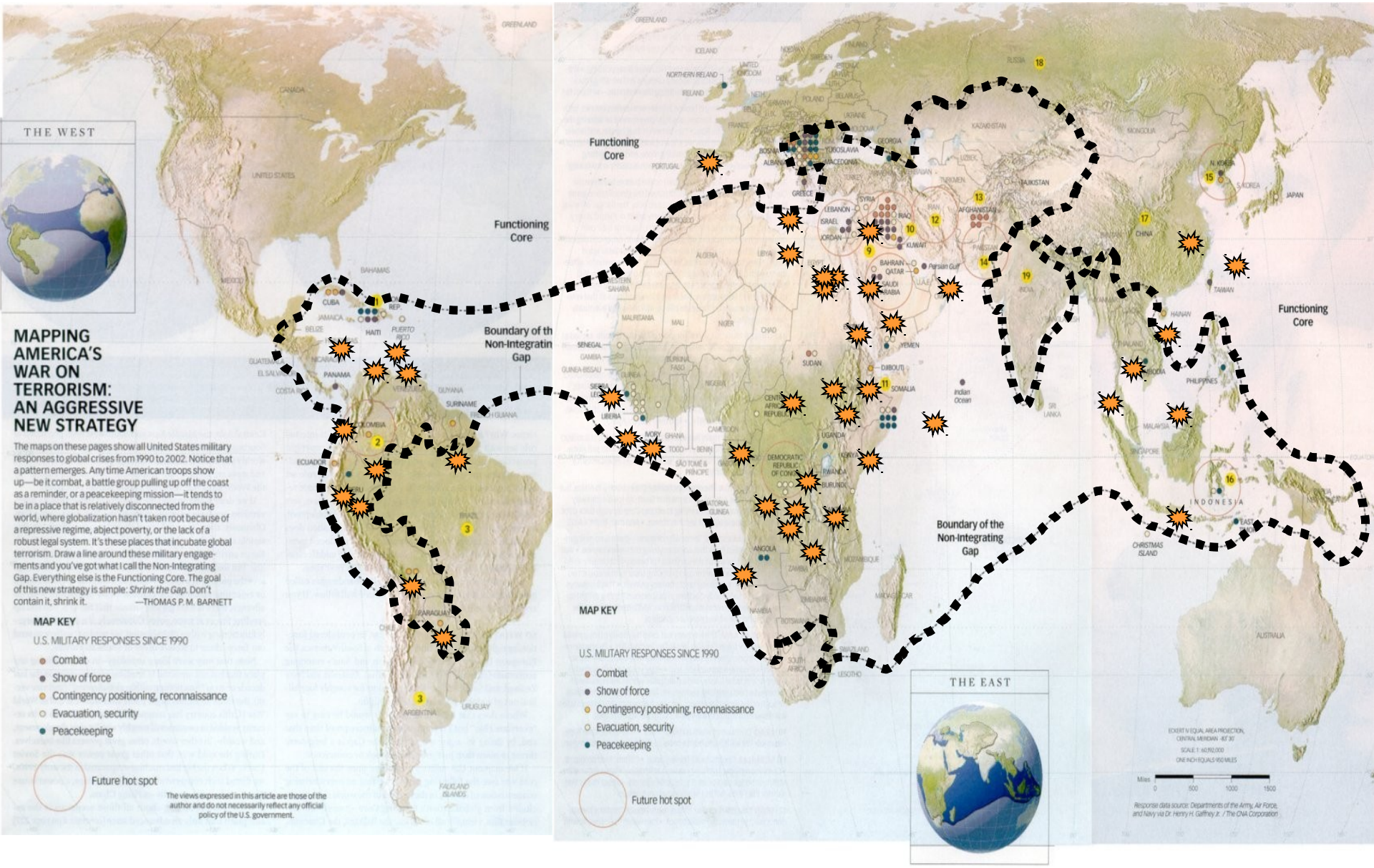


The US intelligence community predicts that changes in population and the spread of information and disease will increasingly threaten US national security.

Water scarcity, in particular, is expected to be a significant cause of instability around the world.

Access to Safe Water, 1990-96




THE WEST
MAPPING AMERICA'S WAR ON TERRORISM: AN AGGRESSIVE NEW STRATEGY
The maps on these pages show all United States military responses to global crises from 1990 to 2002. Notice that a pattern emerges. Any time American troops show up—be it combat, a battle group pulling up off the coast as a reminder, or a peacekeeping mission—it tends to be in a place that is relatively disconnected from the world, where globalization hasn't taken root because of a repressive regime, abject poverty, or the lack of a robust legal system. It's these places that incubate global terrorism. Draw a line around these military engagements and you've got what I call the Non-Integrating Gap. Everything else is the Functioning Core. The goal of this new strategy is simple: Shrink the Gap. Don't contain it, shrink it. —THOMAS P. M. BARNETT
MAP KEY
U.S. MILITARY RESPONSES SINCE 1990
Combat
Show of force
Contingency positioning, reconnaissance
Evacuation, security
Peacekeeping
Future hot spot
The views expressed in this article are those of the author and do not necessarily reflect any official policy of the U.S. government.
Functioning Core
Boundary of the Non-Integrating Gap
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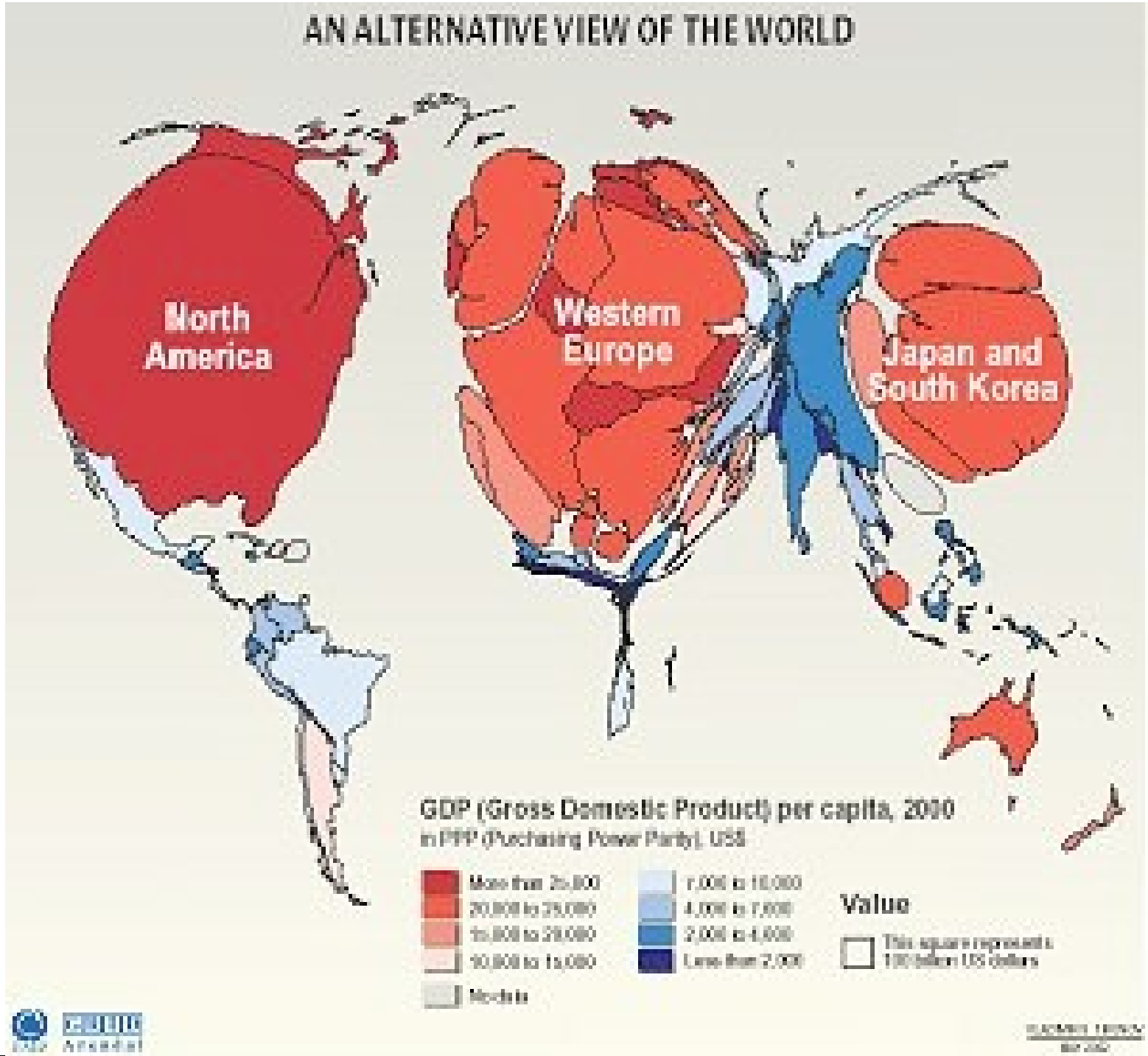
THE EAST
Functioning Core

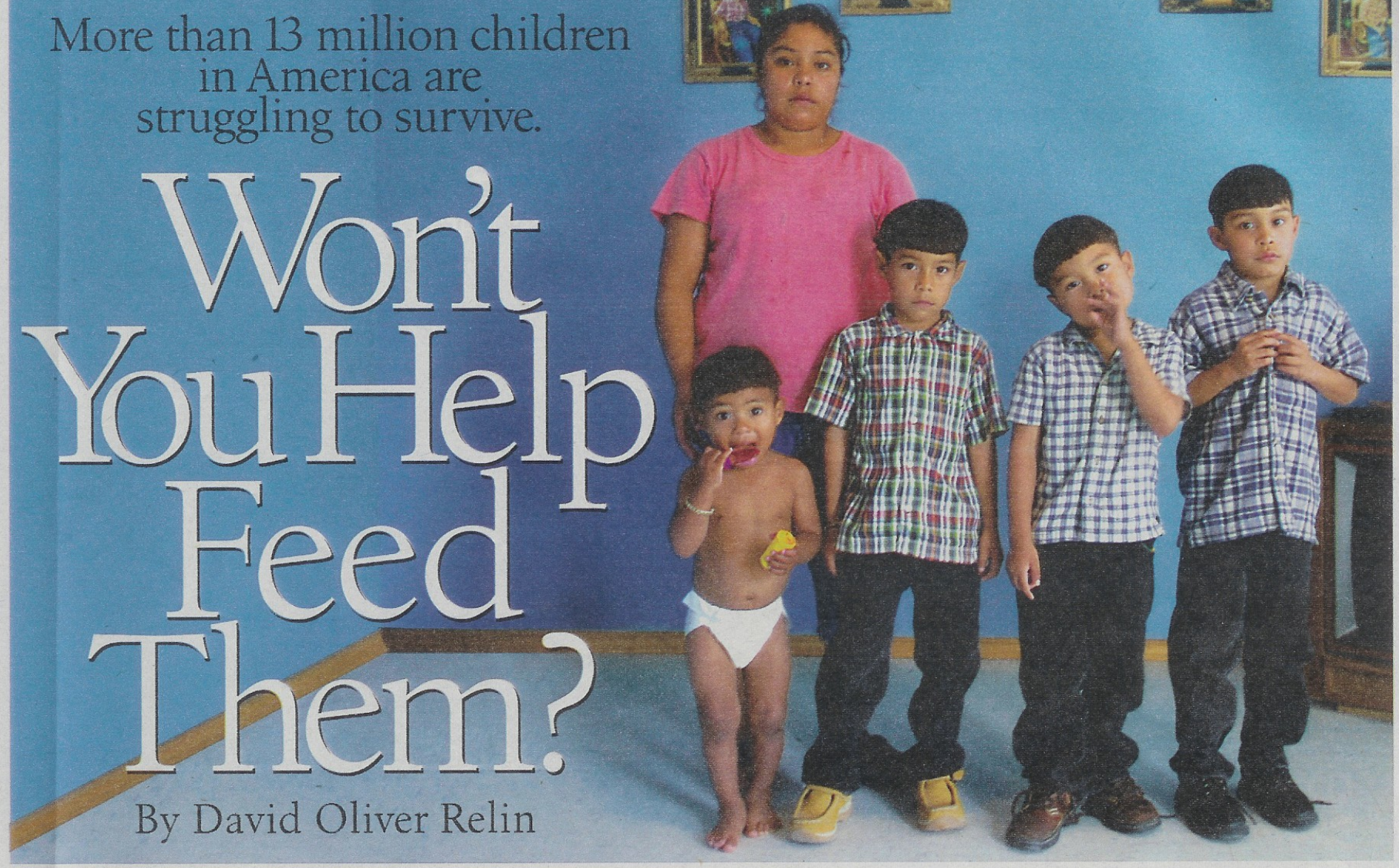
From Esquire, March 2003 issue


AN ALTERNATIVE VIEW OF THE WORLD
North America
Western Europe
Japan and South Korea
GDP (Gross Domestic Product) per capita, 2000
in PPP (Purchasing Power Parity), US$
Value

More than 13 million children in America are struggling to survive.

Won't You Help Feed Them?

By David Oliver Relin



Dulce Compean, 23, and her sons—Ibrayn, 2, Edgar, 6, Ismael Jr., 4, and Eduardo, 7—are among thousands struggling to survive in the Rio Grande Valley.

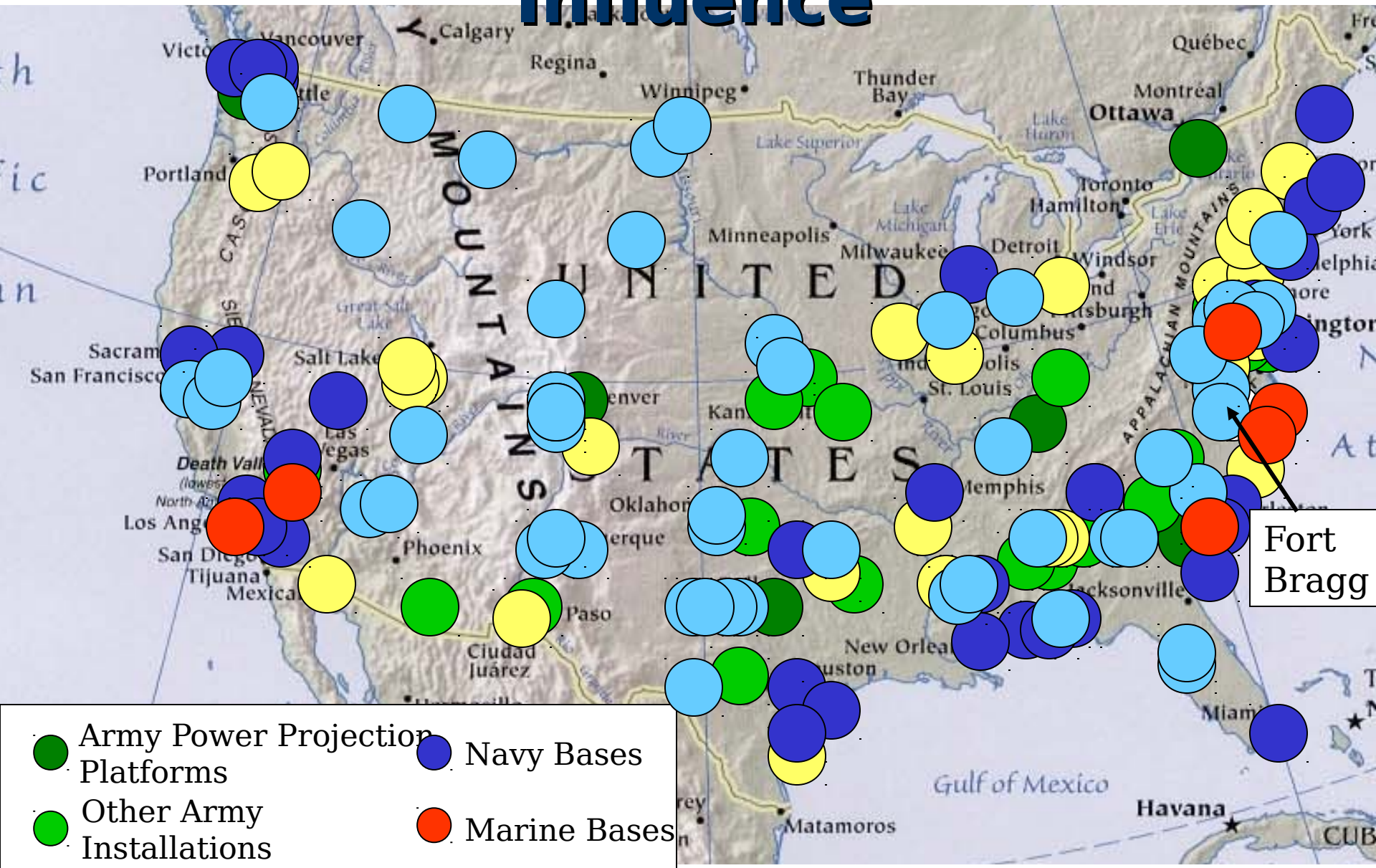
It's a quiet catastrophe that's rarely reported, yet child hunger is a problem we can solve together. PARADE Contributing Editor David Oliver Relin spent months traveling across the country, visiting families in the neediest communities. Here's what he saw.

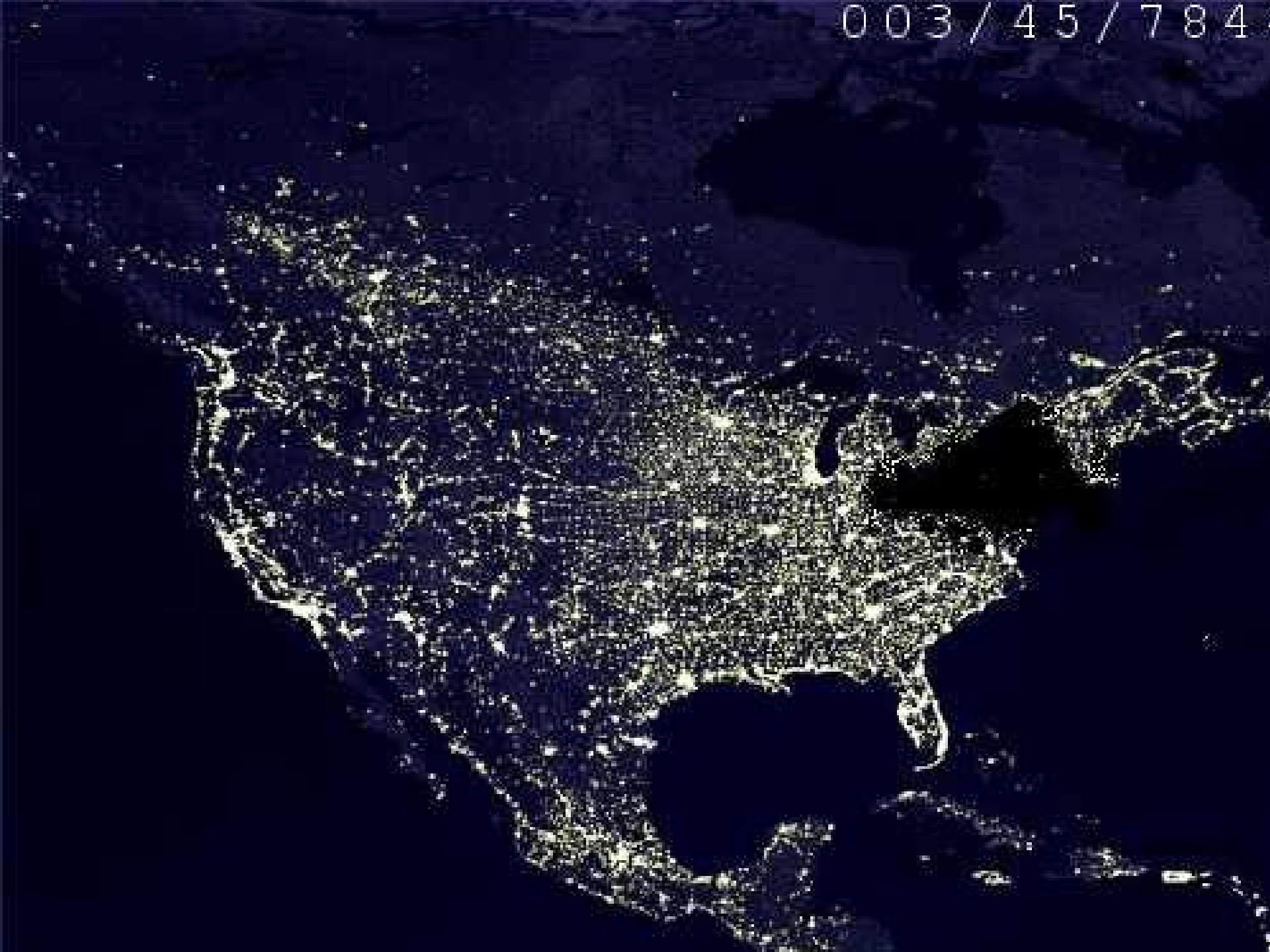
IN THE RIO GRANDE VALLEY, ONLY a few miles from the gaudy new homes

to use half of her last loaf of white bread. The Compeans work hard, but like millions of families

term for those who must survive on a diet not nutritious enough to keep a child healthy. More than 13 million of those people were children. The U.S. Conference of

Military Sphere of Influence

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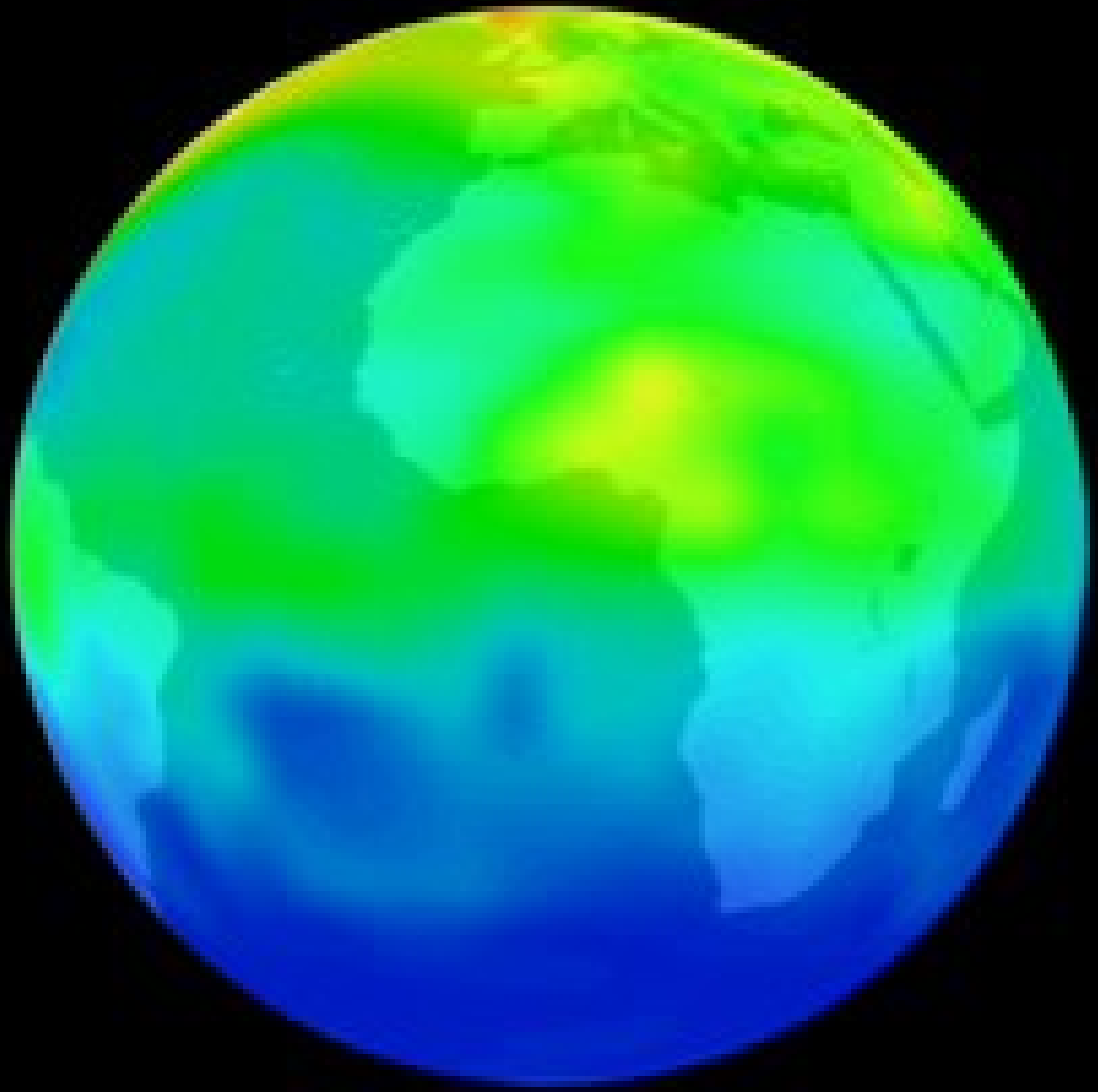
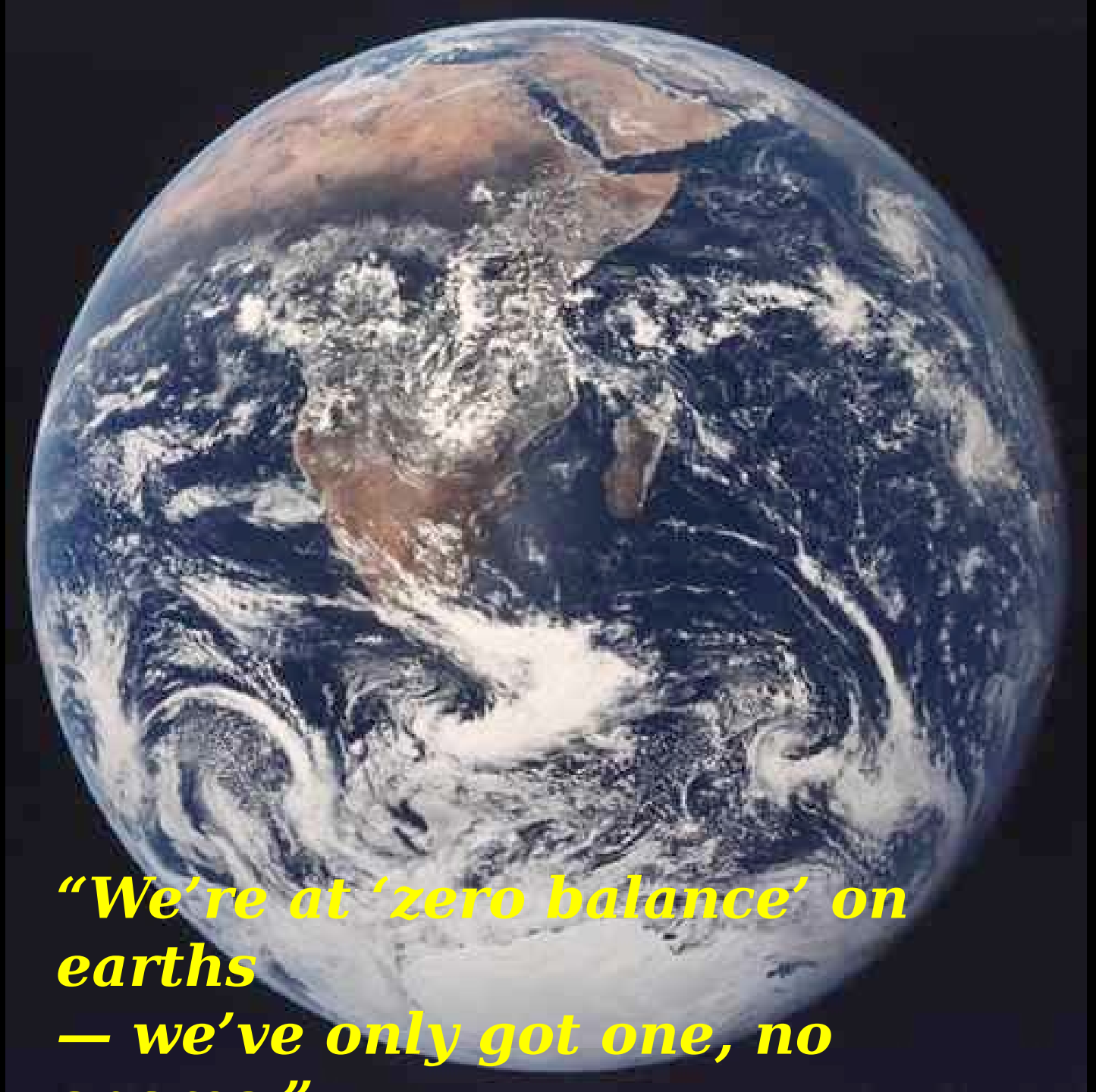




“We’re at ‘zero balance’ on earths
— we’ve only got one, no
spares.”

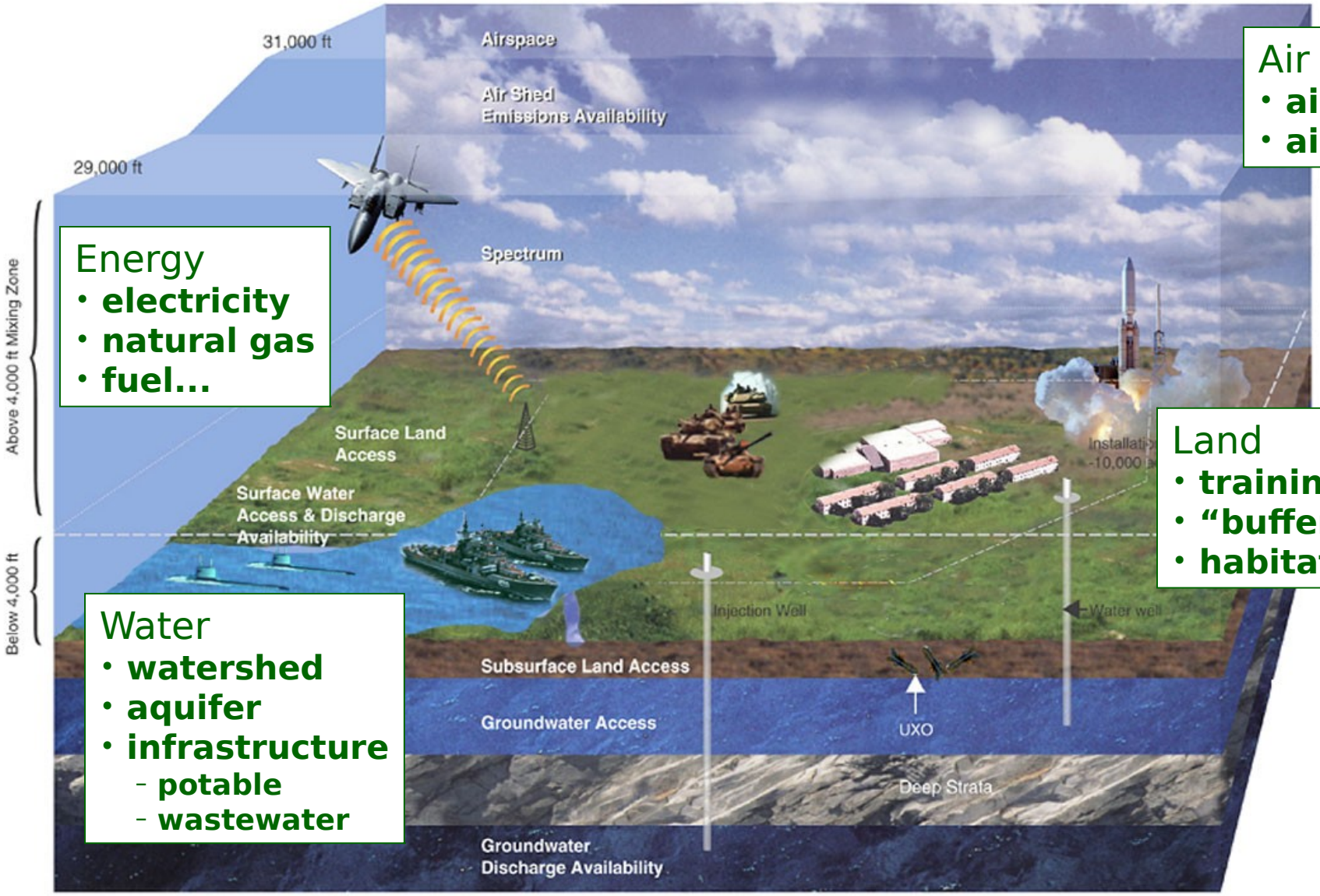
Sustainability Defined

- "…the persistence of the integrity and structure of a system over time."
  - Robert Costanza et al. 2001

- "…the ability of a system to continue functioning into the future without being forced into decline through the exhaustion or overloading of the key resources on which that system depends"
  - Robert Gilman 1996; American Institute of Architects 1996

- "…capacity for continuance into the long term future."
  - The SIGMA Project 2003

Resources We Need



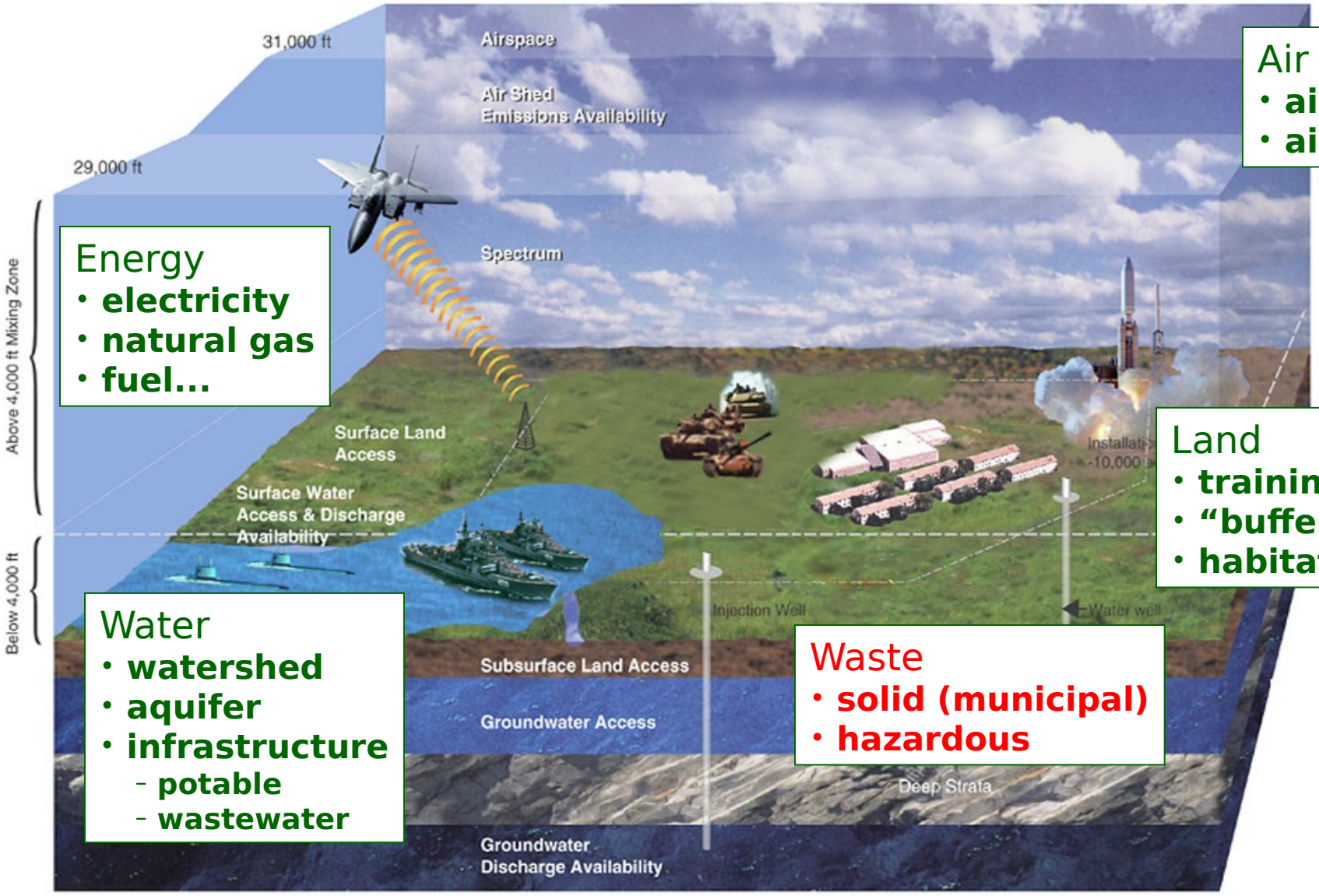
Air
- **air-shed**
- **air space**

Energy
- **electricity**
- **natural gas**
- **fuel…**

Land
- **training areas**
- **“buffer”**
- **habitat**

Water
- **watershed**
- **aquifer**
- **infrastructure**
  - **potable**
  - **wastewater**

Capacities We Need



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- **watershed**
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- **infrastructure**
  - **potable**
  - **wastewater**

Waste
- **solid (municipal)**
- **hazardous**

Sustainability Applications

- Installation Management
  - *viability* (long-term) of mission support capabilities
  - carrying *capacity*, encroachment and *elasticity*
  - *adaptability* in response to change
- Systems Development
  - total ownership *costs*—“cradle-to-cradle”
  - logistical *footprint* and “tooth-to-tail” ratio
  - operational *signature* and *stealth*

Sustainability Targets

- Stationing
  - Army Transformation
  - The Army Basing Study
  - Routine stationing actions
- Management
  - ISO 14001/14004 EMS
  - ISO 14031 EPE
  - SIGMA Guidelines
- Planning
  - Strategic planning
  - Regional planning
  - Master planning
- Costing
  - Systems acquisition
  - Stationing actions
  - Facilities / infrastructure
  - Base operations

Sustainable Stationing

- Capacity Analysis
  - Resource capacity and elasticity
  - Environmental risk factors and “encroachment”
- Cost Analysis
  - Environmental (and interrelated) cost drivers
  - Sustainability costing methodology
- Environmental Impact Analysis
  - Strategic environmental assessment
  - Sustainability analysis

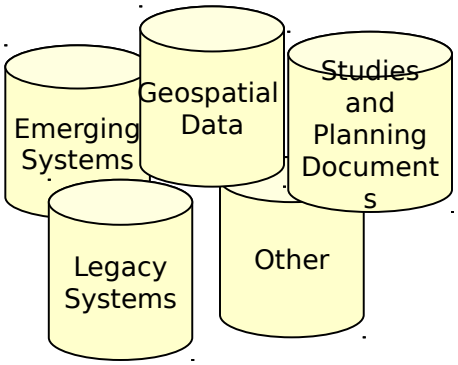
Resource Capability Model*

Determine Operational Requirements

↓

Determine Corresponding Resource Requirements

Determine Resource Availability



Compare resource requirements against resource availability for each resource category using metrics

Resource Categories:

- Airspace
- Air Shed Emissions Availability
- Surface Land Access
- Surface Water Access (Supply)
- Water Discharge Availability
- Spectrum

→

Resource Readiness gs per metric*

RO3 – Major opportunities

RO2 – Significant opportunities

RO1 – Some opportunities

RR – Adequate (Minor opportunities or deficiencies)

RD1 – Some deficiencies

RD2 – Significant deficiencies

RD3 – Major deficiencies

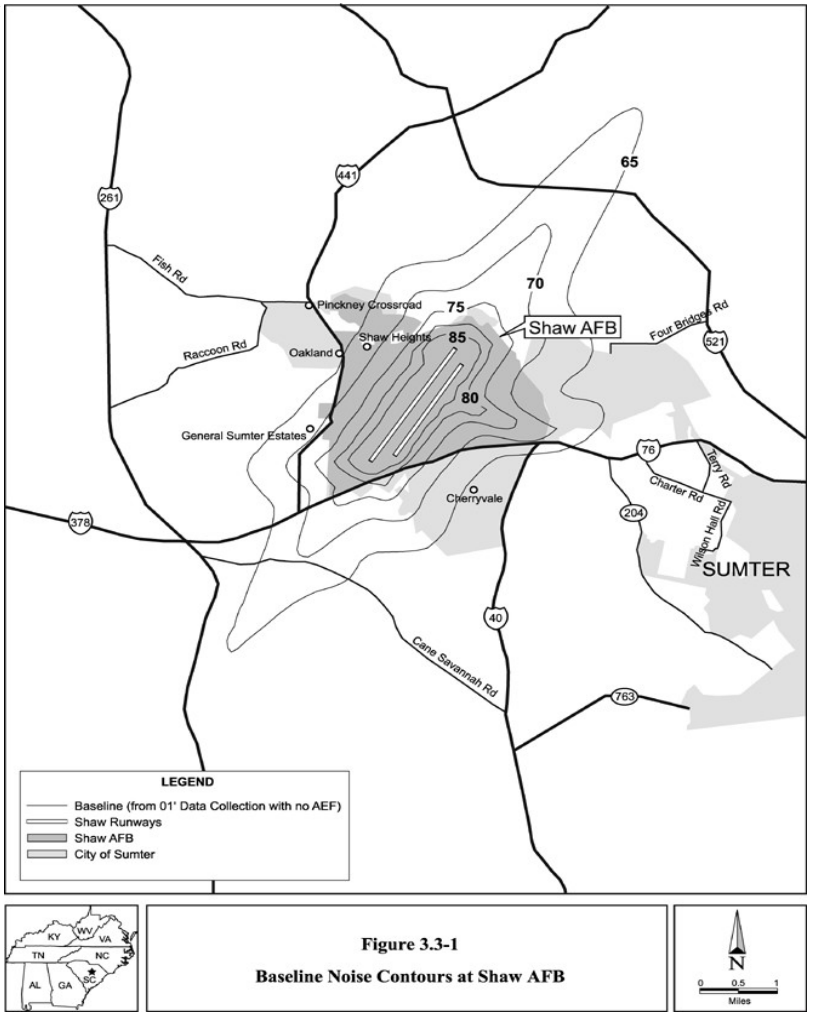
* RO = Resource Opportunity

* RD = Resource Deficiency

**** Developed by Booz-Allen Hamilton***

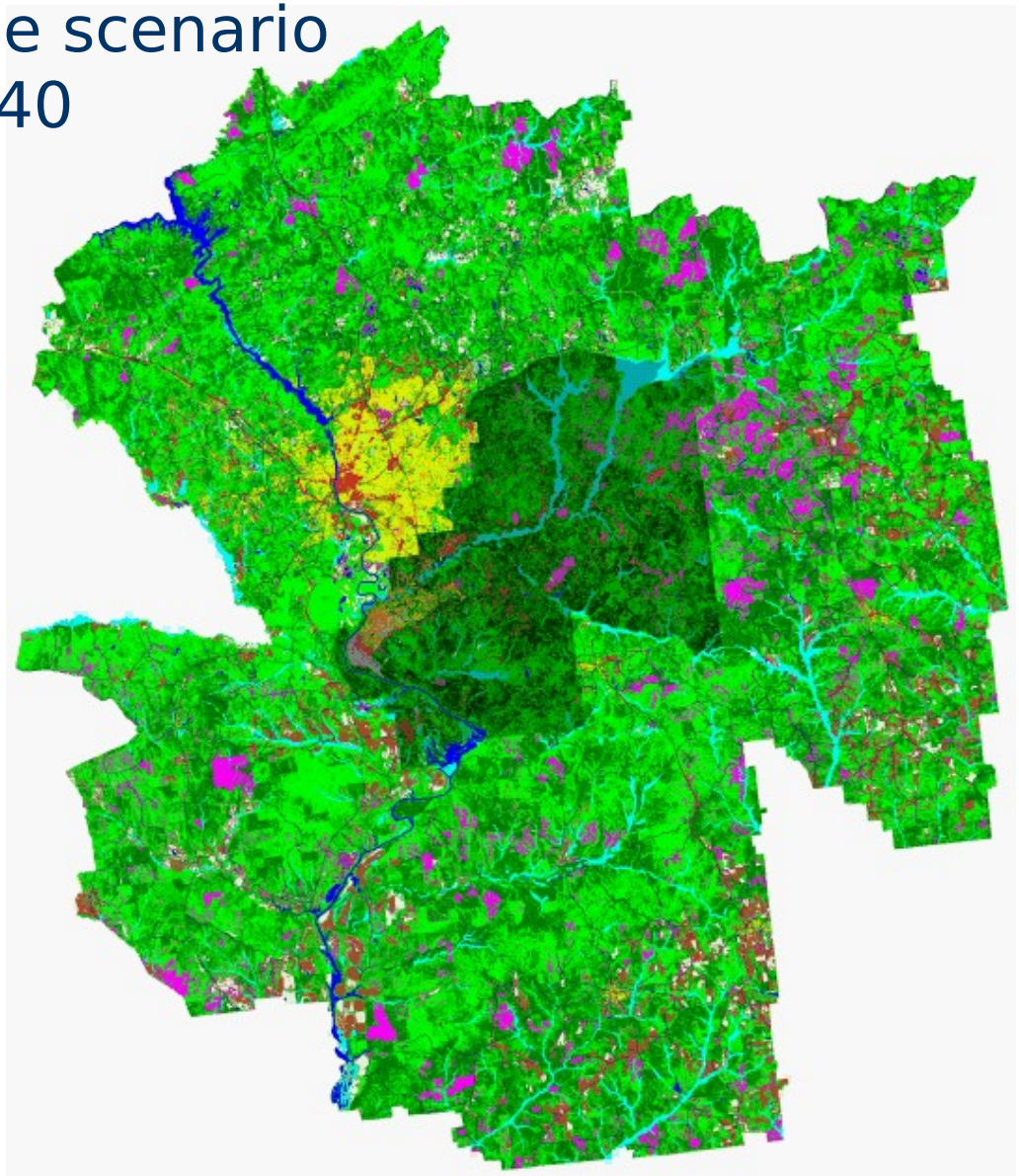
Ex: Surface Land Resource Adequacy for Off-Site *Compatible Acres*

- Resource *Requirements* defined by acres within 65+ dB contours
  - Total acres = 9,600
  - Off-base acres = 6,300
  - On-base acres = 3,300
- Resource *Availability* defined by "compatible acres"
  - 700 - 945 incompatible acres using FAA guidelines (>65 dB DNL)
  - 5,355 - 5,600 compatible acres
  - 85 - 89% compatible acres off-base
- Resource Requirement ("demand") is greater than Availability ("supply")



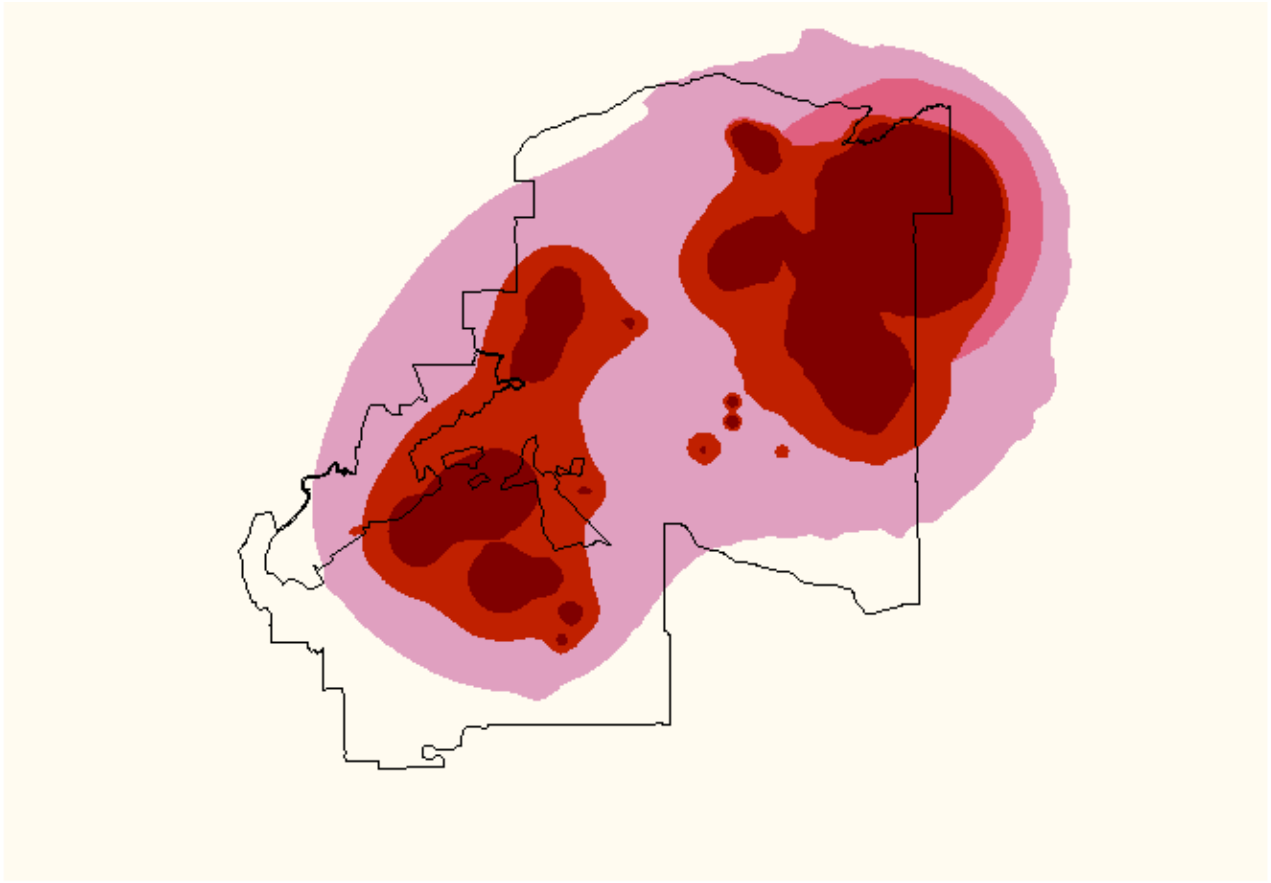
Regional Urbanization

Land use change scenario
Years 2000 - 2040

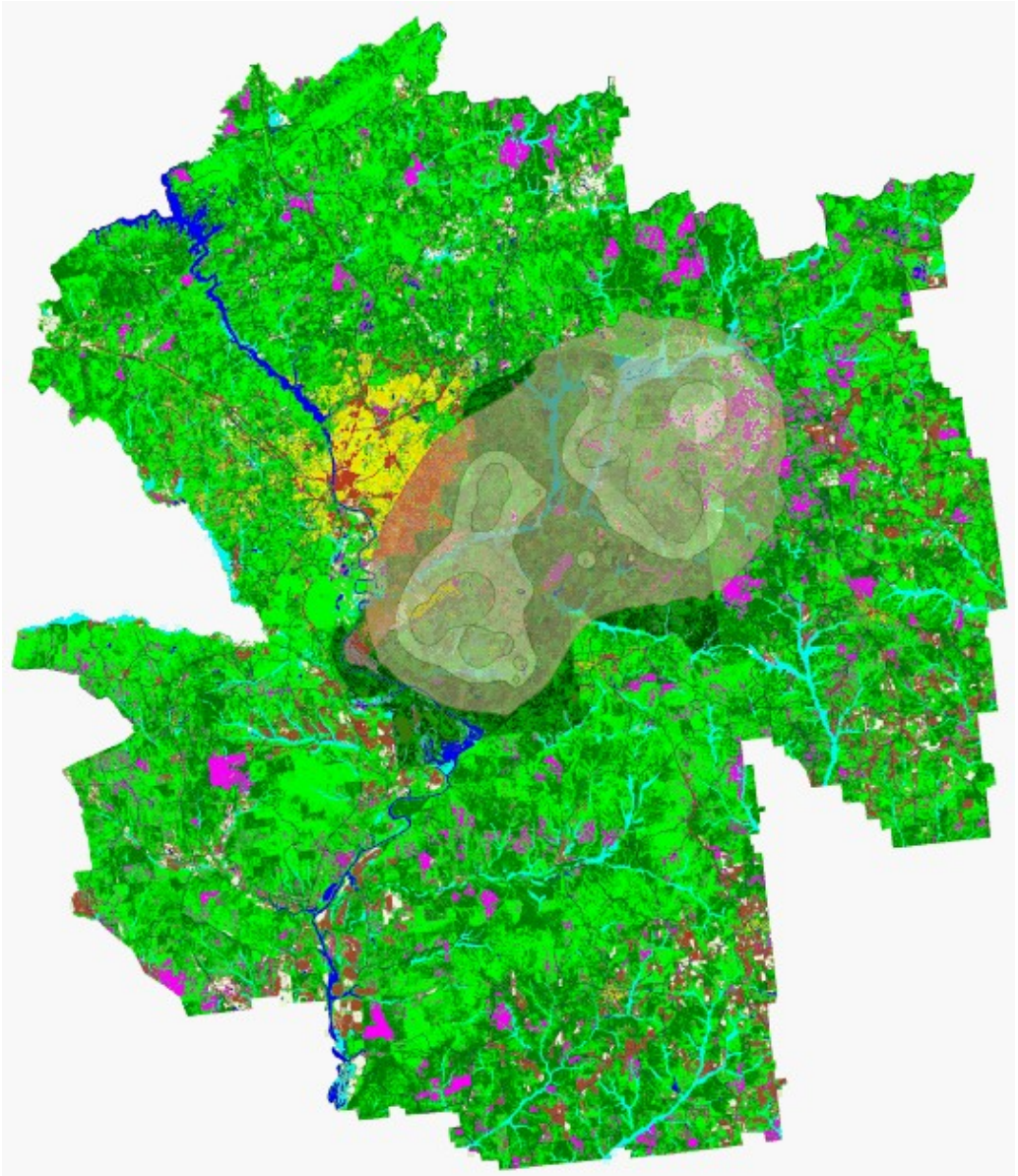


Fort Benning, GA

Mission "Externalities" - Noise



Noise + Urbanization = Conflict



Sustainability Planning

- Installation Strategic Planning
  - Army Strategic Readiness System (SRS)
  - Installation Sustainability Program (ISP)
- Inter-jurisdictional Planning
  - Land use, watershed management and biodiversity
  - Regional transportation and “air-shed” management
- Installation Master Planning
  - Physical development and “fence-to-fence” land use
  - Impact assessment and resource management

Buildings designed in cool shades of 'green'

Lower costs, higher demand produce eco-friendly projects across the USA

By John Ritter
USA TODAY

PORTLAND, Ore.

Step inside a new condominium at The Henry, an upscale residential tower in the chic heart of this city's flourishing downtown.

See the doors and kitchen cabinets made of pressed straw. Notice no new-building smell from paint, glue and carpet. Puzzle at the funny toilets with two flush buttons. Be aware that incandescent lights are nowhere to be found. Stroll down the hall to the handy recycling bins. Turn on tap water heated by exhaust from clothes dryers and ranges. Marvel at the abundance of natural light and ventilation. Tap on hardwood floors cut exclusively from sustainable forests.

Photos by Alan S. Weiner for USA TODAY

Inspired: Senior project manager Dennis Wilde, left, and developer Robert Gerding in a unit at The Henry in Portland, Ore.

Welcome to Portland's newest "green" building — energy-efficient, water-stingy and full of features stressing the natural over the chemical, the recycled over the new and the renewable over the finite. The 123-unit Henry is part of a wave of green projects sweeping the country and revolutionizing the way we design and build.

Whether the tag is "eco-friendly," "sustainable" or "high-performance," green buildings are going mainstream in a big way. In three years, the U.S. Green Building Council has certified 89 office or apartment buildings, manufacturing plants, condos, convention centers, schools and libraries. More than 1,100 buildings have applied for the council's Good Housekeeping-type seal of approval.

"It's not like putting on a hair shirt and moving into a cave," says Dennis Wilde, senior project manager for The Henry. "A

ket. The initial cost to go green may be slightly higher, but the payback in energy efficiency, water conservation and worker productivity easily recoups those outlays, experts say.

"To build a green building is only very marginally more expensive, and that margin is decreasing all the time," says Scott Lewis, a green building consultant here.

> "To build a green building is only very marginally more expensive, and that margin is decreasing all the time."
>
> — Scott Lewis,
> a green building consultant in Portland

The right thing to do

Communications Facility

Fort Gordon, Georgia

- SPiRiT Rating – Gold (70 points)
- $11 Million
- 38,000 SF Capacity – 75 Persons
- FY02 Showcase Project
- Design Build
- Features:
  - Energy Star Roof
  - Water Efficient Fixtures
  - 40% Energy Use Reduction
  - Recycled & Low/Zero Toxic materials
  - Project Design Team Partnership at pre-design and concept phase.
- Completion - March 2004

Library/General Ed. Center

Fort Polk, Louisiana

- SPiRiT Rating – Gold (55 points)
- $10.8 Million
- 6,900 Square Meters Capacity – 740 PNS
- FY02 Showcase Project
- Design Build
- Features:
  - Open Areas and Reduced Footprint
  - High Efficient Irrigation
  - Additional Commissioning
  - Recycled Content Material
  - Humidity Control and Monitoring
- Completion - January 2004

Sustainability Management

- FORSCOM Installation Sustainability Program (ISP)
  - Integrated strategic planning process: baseline, end-state, goals/objectives, measures, initiatives...
- Army Strategic Readiness System (SRS)
  - Balanced Scorecard: mapping the Army strategy for achieving its mission and measuring performance toward strategic objectives
- ISO 14001 Environmental Management System
  - International standard based on “Plan-Do-Check-Act”
- Environmental Performance Assessment System
  - Compliance assessment and management system auditing process
- SIGMA Guidelines
  - Integrating sustainability principles with strategic planning processes, performance measurement, and management systems

Strategy for the Environment

- Sustain resources to support training, testing and other mission requirements
- Reduce lifecycle environmental impacts and total ownership costs of systems, materiel, facilities and operations
- Enhance operational capability and reduce environmental (and logistical) footprint
- Promote well-being and quality of life for soldiers, civilians, dependents and neighbors

NOTIONAL

Sustainability Costing

- Basic “full cost accounting” approach
  - Incorporate actual and potential *costs* and *benefits* (internal & external, direct & indirect) into the equation
  - Address *tangible* and *intangible* costs
  - Consider environmental and, perhaps, social *externalities*
- Seek to estimate true costs and benefits
  - Calculate cost and benefit to the organization to reduce environmental impacts and resource consumptions to a *socially acceptable and sustainable level*

Closing Summary

- Sustainability initiatives target key strategic opportunities for integration:
  - Stationing analysis
  - Strategic installation planning
  - Environmental management systems
  - Systems development (lifecycle)
  - Budgeting and financial accounting
- Sustainability enhances mission effectiveness and contributes to long-term national security

Closing Quote

"…Sustainability moves us beyond simply solving today's problems. A sustainable Army is one that wins today's battles while laying the foundation for our future success. It connects today to tomorrow with sound business and environmental practices… Sustainability enables today's Army to empower the Future Force."

Assistant Secretary of the Army
(Installations & Environment)
September 2003

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Back Up Slides

Sustainability Aspects

- Mission
- Community / Society
- Cost / Economics
- Environment

Environmental Aspects

- Resources
  - Extraction, production, consumption
- Waste
  - Generation, disposition
- Ecosystems
  - Manipulation, displacement, disruption
- Humans
  - Well-being (physical, mental, social, financial)

"Significance"

- Operationally
- Socially (or Politically)
- Financially (or Economically)
- Environmentally

Sustainability Strategies

- Dematerialization
  - Use less (reduce consumption)
  - Waste less (be more efficient)
- Substitution (Trans-materialization)
  - Replace “bad” with “good”
  - Eliminate the need for the “bad”

Sustainability Strategies

- Increase resource productivity
- Eliminate the concept of waste
- Focus on service and resource flow
- Reinvest in natural capital

Sustainability Factors

Waste Disposal Problems

Unreliable Energy

Encroachment

Public Concerns

Resource Scarcity

Environmental Regs

Environmental Enclaves

Wellness Concerns

Aging Infrastructure

Scarce Water

Paralyzing Traffic

Degradation of Training Lands

Cultural Issues